

## Stardust NeXT Comet Lingo Bingo Game Clues

The level 1 questions are more basic than the level 2 questions.

### A.

#### Ion Tail:

1. The bluish tail formed when comet particles are ionized.
2. When vaporized particles flowing off the comet nucleus get excited and glow, this feature is visible.

### B.

#### Deep Impact:

1. This robotic space mission caused a metal impactor to collide with a comet.
2. By using a violent collision to break a hole in the surface of a comet nucleus, this space mission hoped to learn more about the composition of comets.

### C.

#### Rim:

1. This feature defines the perimeter of an impact crater and is higher than the surrounding surface.
2. Surrounding a crater, this raised feature is a common feature to impacts, but absent from most other holes and depressions.

### D.

#### Impact Crater

1. This feature results from an impact between objects in space.
2. These surface features of a comet, asteroid, planet or moon provide insights into what materials lie below the surface, and how old the surface is.

### E.

#### Ice

1. The solid form of matter resulting when a liquid freezes.
2. Water and carbon dioxide are solids at very low temperatures like those found in space so we often use this term to describe the compounds when they are in their solid phase.

**F.**  
**CO<sub>2</sub>**

1. The chemical formula for a compound often found on comets known as carbon dioxide.
2. Existing as a gas in the Earth's atmosphere, this compound of is a solid on a comet unless the comet's orbit takes it near the Sun.

**G.**  
**4.6 Billion**

1. Commonly cited as the age of our solar system.
2. The number of years since the first material solidified in our solar system, forming the building blocks of the planets, moons, the Sun, comets, and asteroids.

**H.**  
**Period**

1. The time it takes for a comet to make one trip around the sun.
2. This measurement of Comet Halley is 76 years.

**I.**  
**Elliptical Orbit**

1. The shape of a comet's path around the Sun.
2. When the force of gravity pulls a comet towards the Sun, but the comet misses the Sun, swings around it, then back out to deep space, the comet moves in an:

**J.**  
**H<sub>2</sub>O**

1. The chemical formula for water.
2. Comets may have provided a large quantity of this compound to Earth during impacts early in the development of the solar system.

**K.  
PAH**

1. Shorthand for Polycyclic Aromatic Hydrocarbons: compounds that are common in oil, fossils and even our food.
2. Found on comets, these organic compounds are hypothesized to be seeds of life that may have been brought to young Earth from a comet impact.

**L.  
Nucleus**

1. The solid material at the center of a comet.
2. The solid body of a comet that can be 10 to 50 km in diameter.

**M.  
Oort Cloud**

1. Far beyond the orbit of Neptune, this region of space is home to most of the comets in our solar system.
2. Occasionally passing stars disturb the orbit of one of the icy bodies from this region, causing it to come streaking into the inner solar system.

**N.  
Comet**

1. This is a small body of the solar system that consists of ices, rock, organics, and other materials.
2. Among the least-changed objects in our solar system these small bodies may yield important clues about the formation of our solar system.

**O.  
Amino Acids:**

1. These molecules are known as the building blocks of life.
2. Containing oxygen, carbon, nitrogen and hydrogen, these compounds in myriad combinations create all known proteins.

**P.  
CAI**

1. Known as calcium aluminum inclusions, these objects are older than the earth.
2. These objects may have been the first generation of solids to condense in the early solar system

**Q.  
Stardust**

1. The robotic space mission that captured material from Comet Wild 2's coma and returned it to Earth in 2006.
2. The spacecraft from this mission is being used again to inspect the crater left in Comet Tempel 1 by the Deep Impact mission.

**R.  
Dust Tail**

1. Made up of fine particles of dust, this feature is left behind as the comet moves through space.
2. When the ices sublime off a comet nucleus nearing the Sun, causing fine, rocky material to eject from the surface, this feature trails the comet and can be millions of kilometers long.

**S.  
Cometary & Interstellar Dust Analyzer**

1. This instrument on the Stardust spacecraft analyzes the dust emitted from comets and other solar system bodies.
2. This instrument, which intercepts dust and performs real-time compositional analysis for transmission back to Earth, will have collected information measuring the dust on two different comets for the first time in history when SD-NExT completes its mission.

**T.  
Cu**

1. The chemical symbol for copper.
2. Deep Impact mission's impactor was primarily composed of this element.

## **U.**

### **Olivine Crystals**

1. This common Earth mineral, also known as the green gem peridot, was found on comet Wild 2's nucleus and only forms at extremely high temperatures.
2. The discovery of the mix of ices and this mineral in crystalline form changed our model of comet formation to include a time when the comet was near the inner solar system as well as residing in the outer reaches of the solar system.

## **V.**

### **Coma:**

1. Latin for hair, this region of the comet surrounds the nucleus and merges into the tail.
2. This cloud of evaporated ices, gasses and dust forms around the comet nucleus as it nears the Sun and can be thousands of kilometers in diameter.

## **W.**

### **Astrobiologist:**

1. A scientist who studies the possibility of life elsewhere in space.
2. By studying organic compounds discovered on objects in space, this kind of scientist studies the intersection of biology and astronomy.

## **X.**

### **Jet**

1. As a comet approaches the Sun and heats up, these features spray up off the surface of a comet like small geysers.
2. Ices, including water and carbon dioxide, may rapidly sublime from a solid to a gas when the comet nears the Sun causing these features to spring up on the comet's surface. They can even exert a force on the comet, changing its direction slightly.

**A.**

1. The bluish tail formed when comet particles are ionized.

Ion Tail

**B.**

1. This robotic space mission caused a metal impactor to collide with a comet.

Deep Impact

**C.**

1. This feature defines the perimeter of an impact crater and is higher than the surrounding surface.

Rim

**D.**

1. This feature results from an impact between objects in space.

Impact Crater

**E.**

1. The solid form of matter resulting when a liquid freezes.

Ice

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